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ABSTRACT

First Steps is a program instituted by the Western Australia Ministry of Education to improve the literacy and numeracy of primary school students, particularly those at risk of academic failure. First Steps is organized around reading, writing, spelling, and oral language; children's skills are organized along developmental continua. These continua are an ordered series of statements describing behaviors children exhibit as they develop literacy skills. This report studies the Reading Developmental Continuum empirically and presents the responses of classroom teachers toward the continuum. Data for the validation of the continuum were provided by teachers of kindergarten, and Years 1, 3, 5, and 7 from a sample of Western Australia schools. Useable data were provided by 36 teachers, each of whom evaluated the position of up to 10 students in their class according to the continuum. Teachers also responded to questions about the indicators for the continuum. Overall, there was a high level of understanding of the indicators. The Reading Development Continuum was thought to depict the order of development of literacy accurately, with two problem areas identified: (1) there was overlap in the estimated difficulty of indicators in the Role Play and Experimental phases; and (2) the key indicators of the Role Play Phase were deemed more difficult than those for the developmentally later Experimental Phase. Teachers also reported that the First Steps continua were either helpful or very helpful to them. Four appendixes contain additional data about teacher responses to the indicators of the continuum and the teacher questionnaire. (Contains 12 exhibits and 6 references.) (SLD)

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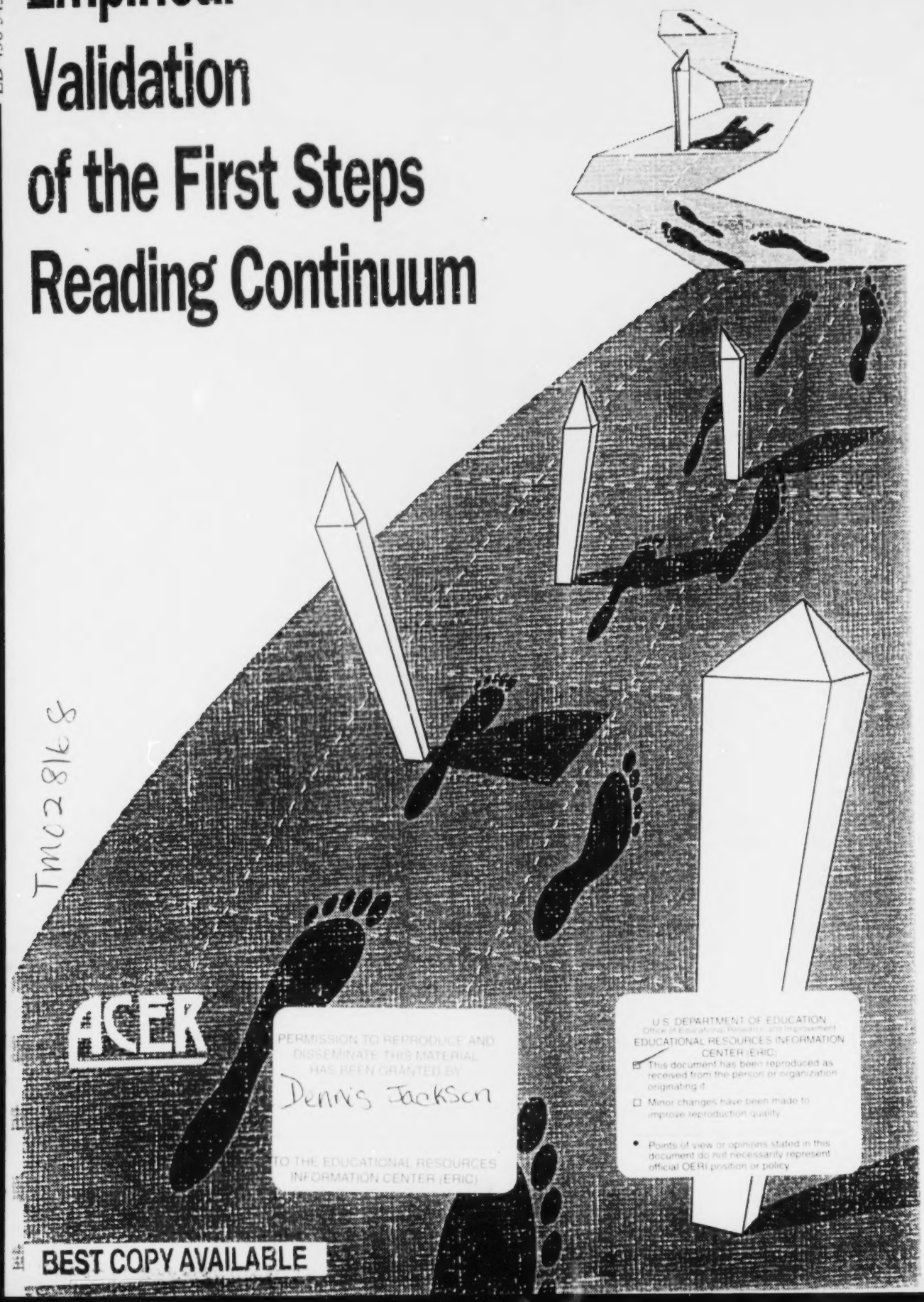
Empirical Validation of the First Steps Reading Continuum



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REPORT ON THE EMPIRICAL VALIDATION OF THE FIRST STEPS READING DEVELOPMENTAL CONTINUUM

to the

Curriculum Development Branch

Western Australian Ministry of Education

ACER

Australian Council for Educational Research, December 1993.

Thanks to all the schools who agreed to participate in the evaluation of First Steps, and an especial thanks to all the classroom teachers who so generously provided the data for this report.

SUMMARY OF THE MAIN FINDINGS

1. There is a high level of understanding of the indicators from the First Steps Reading Developmental Continuum by the Kinder, Year 1, 3, 5 and 7 classroom teachers participating in this evaluation.

2. The Reading Development Continuum, in general, validly depicts the order of the development of children's reading abilities. However, two problems are identified. These are:

- there is considerable overlap in the estimated difficulty of the indicators in the Role Play Phase and the indicators in the Experimental Phase and,
- the key indicators in the Role Play Phase are, on average, more difficult than the key indicators in the developmentally later Experimental phase.

3. Most key indicators in the Reading Development Continuum are shown to have been appropriately defined by First Steps as 'key indicators'. A small number, particularly one in the Role Play Phase, do not seem to be tapping reading ability as well as other indicators. This is a concern.

4. Generally, where problems are identified with the Reading Developmental Continuum, it is in the Role Play Phase.

5. Classroom teachers, forming the sample used for this report, typically regard the Reading or Writing or Spelling or Oral Language First Steps Developmental Continua as accurately depicting the development of literacy in the children that they teach. (Note that the sample was not drawn randomly, so this finding is not generalisable. The finding is, however, consistent with other research findings.)

6. Nearly all teachers in the sample reported that the First Steps Continua are either helpful or very helpful to them. (Again, note that this is not a generalisable finding, although, it is consistent with other research findings.)

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APPENDICES

Appendix A Code Numbers for the First Steps Reading Development Continuum indicators used in graphical displays. Appendix A is printed on pink paper.

Appendix B Estimates of the difficulty of Reading Development Continuum ordered by the code numbers of the indicators and ordered by the estimated difficulty of the indicators. Appendix B is printed on blue paper.

Appendix C List of indicators from the Reading Development Continuum not understood by some classroom teachers. Appendix C is printed on green paper.

Appendix D Questionnaire to classroom teachers about the First Steps Continua. Appendix D is printed on buff paper.

INTRODUCTION[1]

Background to the First Steps Project

First Steps is a program instituted by the Western Australian Ministry of Education to improve the literacy and numeracy of primary school students. It is intended, in particular, to assist in the development of the literacy and numeracy skills of 'at risk' students. First Steps was introduced in 1989 and has been evolving since that time. Most of the work so far produced by First Steps, has focused upon literacy.

First Steps sees the acquisition of literacy as an integrated process. It claims, for example, that;

> "Language development cannot be divided into discrete components. Reading, writing, speaking and listening are interrelated.
> * They parallel each other
> * They complement each other.
> * They support each other.
> * They very often occur together."
>
> *(Writing Development Continuum, p. v)*

Nevertheless, First Steps holds the view that for teaching purposes it is often necessary to focus on particular aspects of language and literacy. This seems a reasonable view. The process of becoming literate, indeed of teaching language skills, is complex and if teaching strategies and methods are to be applied then they will require some form of organisation. First Steps organises aspects of literacy around four themes.

The four themes around which First Steps organises its literacy program are 'Reading', 'Writing', 'Spelling' and 'Oral language'.

Each of the four themes is, in turn, organised around a 'developmental continuum'. These Continua consist of an ordered series of statements describing behaviours children exhibit as they develop literacy skills. These statements are regarded by First

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[1]If you have read the earlier report *Empirical Validation of the First Steps Spelling and Writing Continua* then you will quickly see that the introductory notes used in this report are very closely based upon this earlier report. If you have read the earlier report you may wish to skip to where the discussion of the results from the data analysis begins.

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Steps as akin to milestones marking out a child's development along the road to literacy.[2]

During the construction of these Continua, it was observed by First Steps staff that various indicators clustered together. These clusters of indicators were incorporated into the structure of the Continua and were named 'phases'. For example, in the Reading Developmental Continuum there were six phases identified. These were named 'Role Play Reading Phase', 'Experimental Reading Phase', 'Early Reading Phase', 'Transitional Reading Phase', 'Independent Reading Phase' and 'Advanced Reading Phase'. There are differing numbers of indicators in each phase.

Thus, each Continuum consists of a small number of phases. Within each phase are statements (named 'indicators') that describe various behaviours associated with acquiring literacy. As well, all phases have some indicators that have been judged to be more important than other indicators within that phase. These more important indicators are named 'key indicators'. Key indicators were identified by First Steps personnel during research conducted as part of the development of the First Steps program.

First Steps proposes that the Continua allow a teacher to 'locate' where a child is 'at' in his or her development of literacy skills. Once this location is identified, the most appropriate strategies for that phase of development can be used in the classroom. (First Steps provides many strategies, each linked to the various phases of development.)

The location of a child on a Continuum is established by using the key indicators. If a child has exhibited all the key indicators within a phase, then that child is said to be within that phase. In this way, the phases are used to locate a child on a Continuum. When a child exhibits all the key indicators in the next phase of development, he or she is then said to have moved into the next phase of development. For example, a child who has exhibited all the key indicators in the Experimental Reading Phase will remain in that phase until he or she has exhibited all the key indicators in the Early Reading Phase.

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[2]More precisely, the First Steps Developmental Continua represent the milestones of children's development in English speaking countries where a Western school system operates. This includes such countries as Australia, Canada, New Zealand, United Kingdom and the United States. The research drawn on during the construction of the First Steps continua was largely from these countries. Until there is evidence which shows the continua generalise beyond these school systems, it is probably better to approach their use in other school systems with caution.

First Steps suggests that, at any given time, a child will probably exhibit behaviours across several of the phases. This occurs because of variation in children's development. However, it is claimed that, overall, the Continua do depict the typical patterns of development to be found in children.

Background to the evaluation of First Steps

The WA Ministry of Education approached ACER in early 1992 to evaluate First Steps. Work for the evaluation began in April 1992. Three reports have so far been produced as part of the evaluation. These are; *The Impact of First Steps on Schools and Teachers* and *The Impact of First Steps on the Reading and Writing ability of Year 5 students*, and the *Empirical Validation of the First Steps Spelling and Writing Continua*.

This report describes how the Reading Continuum was examined (or 'validated').

Aims of this report

This report has two aims. The first is to empirically validate the Reading Developmental Continuum. The second is to report how classroom teachers view the validity of the First Steps Continua.

Structure of the Report

The report has two main parts. The first deals with the empirical validation of the Reading Continuum. The second part deals with the responses of classroom teachers to this Continuum. This second part is based upon responses taken from questionnaires sent to teachers as part of the evaluation.

Editor's Note

This document is one of a series of reports that document the formative research that supported the creation and development of *First Steps*™. As a result of this research, the Education Department of Western Australia (EDWA), in collaboration with the Australian Council for Educational Research (ACER) revised *First Steps* in response to each of the issues and questions raised by this research. *First Steps* training courses, Developmental Continua, and Resource Books are published with due amendments and alterations.

Other research documents that support the development of *First Steps* include:

Dr. Phil Deschamp:

- A Survey of the Implementation of the Literacy Component of the *First Steps* Project in WA
- The Implementation of The Literacy Component of The *First Steps* Project in ELAN Schools
- A Survey of the Effectiveness of the Focus Teacher 'B' Training for the *First Steps* Project
- Student Achievement: A Study of the Effects of *First Steps* Teaching on Student Achievement
- Case Studies of The Implementation of the *First Steps* Project in Twelve Schools
- The Development and Implementation of the *First Steps* Project in Western Australia

ACER:

- Empirical Validation of the *First Steps* Reading Continuum
- Empirical Validation of the *First Steps* Spelling and Writing Continua
- Empirical Re-Validation of the *First Steps* Spelling Continuum
- Assessment and Record of the Changes made to the Spelling Continuum
- The Impact of *First Steps* on Schools and Teachers
- The Impact of *First Steps* on the Reading and Writing Ability of Year 5 Students
- Background: *First Steps* and the ACER Evaluation & Report on the Validity of the *First Steps* Writing and Spelling Continua*

EDWA:

- Supporting Linguistic and Cultural Diversity Through *First Steps:* The Highgate Project

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PART 1: THE EMPIRICAL VALIDATION OF THE FIRST STEPS READING DEVELOPMENTAL CONTINUUM.

The research objective

The objective of the empirical validation of the Reading Development Continuum is to collect information about the typical sequence in which students learn and to compare this with the sequence of learning proposed in the Reading Development Continuum.

The research is not concerned to establish the validity or the meaning of the concepts used to describe the indicators. The research reported here cannot answer questions about whether, say, an indicator from the Role Play Phase such as 'The child uses pictorial cues' is meaningful or accurate. (It may, however, alert users to problems which arise because of incoherence or inaccuracy in an indicator.) As the indicators are drawn from empirical research the question of their accuracy and meaning needs to be addressed using other methods. This research is designed to find out about the ordering of the indicators of the Reading Development Continuum as proposed by First Steps.

The Reading Developmental Continuum will be regarded as validated if the order of the indicators proposed by First Steps matches the order of development that teachers see in their students.

The research questions

The following specific questions are addressed in this report:

Which First Steps indicators do teachers not understand?
Are the indicators within a phase at about the same level of difficulty?
Do the phases reflect a sequence which implies increasing difficulty?
How 'key' are the 'key indicators'?

The Sample

The data for the validation of the Reading Developmental Continuum were provided by teachers of Kindergarten, Years 1, 3, 5 and 7 students from a sample of Western Australian government primary and District High schools.

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The sample was not randomly drawn. As the Reading Developmental Continuum is not yet widely used by schools, it was decided to approach those schools which were thought to be most involved with it. These schools were identified by staff in the regional offices of the Ministry.

Some schools which have had limited involvement with the Reading Development Continuum were inadvertently approached to participate in the validation. Some of these, despite their relative unfamiliarity with the Continuum, agreed to participate in the research. Thus not all the data come from teachers who were widely experienced with this particular continuum. It is not clear what effect this has had on the quality of the data. It has been assumed that the effect is minimal.

Altogether, 54 teachers agreed to participate in this part of the evaluation. Of these 54 teachers, 36 returned data that could be used. Exhibit 1 shows the numbers of teachers who responded for each Year level.

Exhibit 1: Number of teachers providing data for the validation of the Reading Developmental Continuum for each Year level.

Kinder	Yr 1	Yr 3	Yr 5	Yr 7	Total
4	9	8	9	6	36

The Data

The data consist of judgements made by teachers about the extent to which each of up to ten students in their class exhibited evidence of having demonstrated the behaviour described by each of a number of First Steps indicators. (The teachers made these judgements about each child in turn and not about the group of children.) These judgements were recorded on a computer used by the teachers. They tapped one of a set of appropriate keys to register their response. There were two sets of responses available to a teacher depending upon which indicator was displayed to them. The response set to be used was pre-determined. Teachers could not choose which response set to use.

The first response set was:

Y - (Yes/Most of the time)

This key was to be pressed if the named student usually demonstrated this behaviour.

N -(No/Hardly Ever)
This key was to be pressed if the named student did not or hardly ever demonstrated this behaviour.
U - This key was to be pressed if the teacher was unable to make a judgement. If they responded with 'U', the program asked the teacher to select one of the following:

1 - I have not yet had an opportunity to gather information relating to this indicator.
2 - I don't understand the wording of this indicator.

If the teacher entered 'U' then the program displayed all students' names, and beside them the response - 'U'. That is, if the teacher did not understand the indicator for one student, it was assumed that they did not understand it for all students. If the teacher had understood the indicator, then after all students had been evaluated with respect to that indicator, the results of the teacher's judgements were displayed on the screen and an opportunity was given to alter the data.

The use of the first response set was not appropriate for all indicators. If this response set, and only this response set, had been used, then it would have led to ambiguous responses for some indicators. For example, consider the indicator from the Early Reading Phase of the Reading Developmental Continuum: 'The child points as an aid to reading ... ' (code number 2324, Appendix A). A response 'Hardly ever' could mean that the child 'Hardly ever points' because he or she is yet to learn how to do this. But the response 'Hardly ever' could also mean that the child 'Hardly ever points because he or she has advanced beyond this level of reading.' To overcome this problem, a second response set was developed. This second response set has the additional category of 'Beyond'.

The second response set was:

B - (Beyond this level.)
This key was to be pressed if (1) the indicator was phrased negatively and the student demonstrated evidence of being able to perform the converse of the indicator, (2) the indicator began with the phrase "Beginning to ..." and the student had fully acquired the skill referred to in to the indicator or (3) a student had developmentally 'left behind' the indicator and so no longer demonstrated evidence of it (as opposed to having yet to develop this skill).

Y - (Yes/Most of the time)
This key was to be pressed if the student usually demonstrated this behaviour.
N -(No/Hardly Ever)
This key was to be pressed if the student did not, or hardly ever, demonstrated this behaviour and was yet to move beyond the level required to demonstrate competence on this indicator.
U - This key was to be pressed if the teacher was unable to make a judgement.
(The same categories - 1 or 2 - as for the first response set were then displayed.)

In the data analysis 'Yes' and 'Beyond' were treated as having identical meaning and so coded to the same value. (Responses with the value 'U1' and 'U2' - unable to make a judgement - were excluded from the analysis which estimated the difficulty of the indicators.)

Teachers were asked to provide data for the first five female students on a class list and for the first five male students on a class list. If a class had less than five female students or less than five male students then teachers were asked to 'top up' with other students from the class. In some small schools and in some composite classes there were less than ten students at a given Year level. In these cases, teachers were asked not to top up with students from other Year levels.

Exhibit 2: Number of students involved in the study of the validation of the Reading Developmental Continua for each Year level.

Kinder	Yr 1	Yr 3	Yr 5	Yr 7	Total
31	85	80	69	54	319

The data for the validation of the Reading Developmental Continuum were collected in November 1993.

In summary, the data consist of judgements made by classroom teachers about the literacy behaviours of selected students on a number of different First Steps indicators.

The Design of the Research

It was decided to design the data collection in such a way as to avoid asking teachers about indicators which described behaviours that would be unlikely to be observed in their students. For example, Year 1 teachers were not asked to provide data about the indicators in the Transitional or Independent Reading Phases because it was felt to be most unlikely that any Year 1 students would exhibit any of these reading behaviours. No teachers were asked to provide data about the Advanced Reading Phase because it was judged that no primary school child would be in this Phase.

To ensure that the data could still be used to depict a sequence of development across all phases of a Continuum, each Year level had at least one phase in common with the Year level below it or with the Year level above it. Exhibit 3 shows which phases of the Reading Developmental Continuum were used for each Year level, how these phases overlapped and how many indicators are in each phase. For example, in Exhibit 3, the column under the title 'Yr 1' indicates that Year 1 teachers providing data on the Reading Developmental Continuum, had indicators drawn from the 'Role Play', the 'Experimental' and the 'Early Reading' Phases. This means that for these Year 1 teachers there were 74 (21+ 26+ 27) indicators judged per child.

Exhibit 3: Number of indicators per phase of the First Steps Reading Developmental Continuum for each Year level and distribution of phases across Year levels.

Reading Continuum Phases	N. of Indicators	Kinder	Yr 1	Yr 3	Yr 5	Yr 7
Advanced	22					
Independent	19				√	√
Transitional	23			√	√	√
Early Reading	27	√	√	√		
Experimental	26	√	√			
Role Play	21	√				
Total N of Indicators	138	74	53	50	42	42

Teachers were allocated phases according to the Year level that they taught. Phases were matched to Year level on advice from the First Steps project personnel. The matching was designed to ensure that the chosen phases were appropriate to the level

of development of the students. Inappropriate phases were, either, ones that contained indicators which all students of a given Year level would exhibit, or that contained indicators which no students, of a given Year level, would exhibit. A mix of student abilities was needed.

Teachers providing data about the reading Developmental Continuum made, depending on the Year level taught and the number of students assessed, between about 420 and 740 judgements upon the reading behaviours of their students.

Method of Data Collection

All teachers were sent a computer disk. On this disk was a computer program written by staff at ACER. When the program was run it prompted teachers for responses to questions. These responses were stored on the disk and when the teacher had entered the data, the disks were returned to ACER. Each teacher received a disk containing the teacher's name, Year level, and the indicators for the phases of the Continuum for which they would be providing data.

When the program was run the teacher was first asked to enter the names of the students to be used, that is, the names of the first five boys and the first five girls on a class list. (Where there were fewer than five boys or five girls alternatives, described above, were adopted.) Student names were needed so that the teacher could be prompted for each specific child. The names of the teachers and the children have been removed from the data at ACER and no record has been retained of them.

Teachers were next asked the following questions about each child:

What is the child's sex? (M/F)
Is English the first language of the child? (Y/N)
Is the child an Aboriginal or Torres Strait Islander? (Y/N)
Is the child receiving English as a Second Language assistance? (Y/N)
Does the child have a disability that could significantly affect achievement in English? (Y/N)

Once this was done, the teacher was presented the text of an indicator with the instruction to assess each student with respect to the indicator on display. The indicators were presented to the teachers in random order. The teachers knew only that the indicators were from Reading Development Continuum and that the indicators came from one of two or three phases. They did not know, unless they

recalled it from their own use of the Continuum, from which phase a displayed indicator came. Nor did they know if an indicator was a key indicator.

It was estimated that teachers would take up to two hours to make all their judgements and enter the data. The computer program was designed so that teachers could quit before completing all the data entry and resume later.

Method of Data Analysis

The data for the empirical validation were analysed using the computer program "Quest" (Adams and Khoo, 1992) which produces Item Response Theory calibrations of indicators and measures of student achievement. An outline of this approach is provided below.

Data Analysis

The first step was to analyse data that had been collected about the students in the study. If these children had characteristics which suggested that their development of literacy skills might occur in a different order from most other students, then it was important to know this because it could effect the interpretation of results.

It was possible to remove non-typical children from the analysis in an attempt to avoid any possibly distorting effects on the results. However, it was decided to retain all children because First Steps was instituted to assist precisely those children whose non-typicality placed them 'at risk'. Also, keeping all these students in the analysis means that the results are based upon a group of students who might typically make up a classroom.

Attributes of the Children

1. Sex

It is generally the case that girls are more precocious than boys in the acquisition of literacy skills. It was therefore felt important to describe the distribution of the sex of the students. Exhibit 4 shows this for each Year level for the Reading Developmental Continuum.

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Exhibit 4: Frequency and percentage of students involved in the study of the Reading Developmental Continuum by sex for each Year level.

	Kinder	Yr 1	Yr 3	Yr 5	Yr 7	Total
Female	16 (52%)	44 (52%)	37 (46%)	40 (58%)	29 (54%)	166(52%)
Male	15 (48%)	41 (48%)	43 (54%)	29 (42%)	25 (46%)	153(48%)
Total	31 (100%)	85 (100%)	80 (100%)	69 (100%)	54 (100%)	319(100%)

Exhibits 4 shows that the number of boys and girls is similar for each Year level for the Reading Development Continuum. At Year 5 there are somewhat more girls than boys. It is not clear why this should have occurred because there were no single sex schools in the sample. It is assumed to have arisen randomly.

2. English as a Second Language (ESL)

It was important to identify children for whom English is a second language because, according to research conducted by the English as a Second Language Unit, Western Australian Ministry of Education, the 'levels of competency displayed by second language learners do not reflect their actual levels of concept development.' (*Writing Developmental Continuum*, p. *v*) If there had been a large proportion of ESL children used in the validation of the Continuum then the relationship between the range of difficulty of different phases may have been distorted. In fact there was only one student with English as a second language. This student was in Kindergarten.

3. Disability affecting achievement in English.

Teachers were asked if any of the children about whom they were making judgements had a disability that could 'significantly affect achievement in English'. The number of students described by teachers as having a disability that could affect performance in English was low. No kindergarten students, four Year 1 students, one Year 3 student, two Year 5 students and no Year 7 students were described as having a disability affecting achievement in English. These are small numbers so the inclusion of these students in the analysis is unlikely to have caused any important distortion in the patterns in the data.

4. Aboriginality

The data identifying whether a student was an Aboriginal or a Torres Strait Islander were collected so that if sufficient numbers of students were identified, analyses could be run separately for this sub-group. There were 13 Aboriginal or Torres Strait Islander students in the sample. This is too few students for these analyses to be conducted. The data on Aboriginality were, therefore, not used in the validation of the Reading Development Continuum.

Empirical Validation of the First Steps Reading Developmental Continua

In this part of the report four main questions are addressed:

1. Which First Steps indicators do teachers not understand?
2. Are the indicators within a phase at about the same level of difficulty?
3. Do the phases reflect a sequence which implies increasing difficulty?
4. How 'key' are the 'key indicators'?

In answering these questions, the first and fourth are addressed directly. The second and third questions, however, need to be approached less directly. To answer these questions, the method used to validate the Continuum is described. Next, an ideal model is proposed. This model shows how the level of difficulty of indicators within a phase ought to appear if a Continuum is to depict children's development. The model also shows how the phases ought to reflect the increasing levels of difficulty along such a Continuum. Once this ideal model is described, the validation of the Reading Development Continuum, can begin. The Continuum is evaluated by comparing patterns in the data with the ideal model. The closer the patterns approach the ideal model, the more valid the Reading Developmental Continuum will be. It is only at this point that the second and third questions can be answered.

Each of the four questions is now addressed.

Which First Steps indicators do teachers not understand?

It is important to know how well teachers understand the indicators. Generally, if there are many misunderstandings then the Continuum will not be consistently used. More specifically, if the indicators are not well understood then the data supplied by teachers for the validation will be adversely effected. The data, used here to validate the continua, rely on teachers understanding the indicators. (Any indicators which teachers do not understand are excluded from the validation procedure.)

When making judgements about a student's competency on an indicator, teachers were able to indicate whether they understood the indicator or not. Analysis of their responses shows that the indicators are well understood by the teachers in the sample. It should be noted, however, that this is not evidence that they all understand the indicators in the same way.

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From the analysis of the 'U2' responses - those instances when teachers recorded that they did not understand an indicator - it was found that of the 116 indicators from the Reading Development Continuum 20 (17%) were not understood by at least one teacher. Of the 20 indicators not understood, 0 came from the 21 indicators in the Role Play Reading Phase, 1 came from the 26 in the Experimental Reading Phase, 4 came from the 27 in the Early Reading Phase, 12 came from the 23 in the Transitional Reading Phase and 3 came from the 19 in the Independent Reading Phase.

Of these 20 indicators, 15 were not understood only once, 4 were not understood by two teachers and 1 indicator was not understood by three different teachers. The indicator not understood by three teachers was: "The child can discuss an alternative reading of a text.' (Code 2507) This indicator may require some clarification.

Appendix C lists all those indicators from the first five phases of the Reading Development Continuum not understood by teachers and the number of the teachers who did not understand them.

In summary, about 80% of all indicators were understood by all the teachers who responded to this part of the evaluation. Of the 20% of indicators not understood by all teachers, all but one were not understood on only one or two occasions. Thus these teachers seem to well understand the Reading Developmental Continuum indicators.

Validation

a. Calibrating Indicators

Before considering the results of the empirical validation of the Reading Developmental Continuum it is necessary to outline how the data were analysed.

The first aim of the data analysis was to 'calibrate' the indicators for the Reading Development Continuum. The calibration process (based on the Rasch[3] model) estimates a 'difficulty' level for each indicator. In general, the greater the number of students achieving an indicator, the 'easier' (lower on the scale of difficulty) that indicator is estimated to be. In this way, the calibration process parallels the intention of First Steps by seeking to locate indicators at positions along a continuum.

[3]Named after the Danish psychometrician who invented the mathematical procedures upon which Item Response Theory is based.

Put more simply, a First Steps Continuum can be likened to a pathway along which children progress, acquiring literacy skills as they go. The further along this pathway the child goes, the more difficult it becomes. On a real path, the difficulty increases as a function of physical tiredness. On the metaphoric pathway to literacy, the difficulty increases because the behaviours the children show, require higher levels of skill. The First Steps indicators act as sign posts on this path. They mark out where the child is and so what the child has achieved (and has yet to achieve). The first aim of the analysis is to identify where these sign posts are along the path and, in so doing, to identify the difficulty of each of the indicators.

It should be noted that this approach assumes that there is one underlying continuum that goes to make up the process of learning to read. Some theorists would argue that learning to read is a multi dimensional process which cannot, therefore, be captured using a single continuum. The judgement made here is that it can be captured on a single continuum. This judgement is based upon the view that it is reasonable to claim that some children read better than others. In such a claim there is an implicit assumption that there is only one organising dimension being tapped, so the use of a continuum is appropriate.

b. An ideal model for the distribution of indicators within phases along a developmental continuum.

Having estimated the difficulty of the First Steps indicators - the first aim of the data analysis - the next aim is to establish how well the observations that teachers make about the development of literacy match the developmental Continuum proposed by First Steps. This task is referred to as the empirical testing of the validity of the Continuum.

The empirical testing of the validity of the Reading Development Continuum involves comparing the order of the indicators proposed by First Steps with the order produced by the analysis of the data supplied by teachers. This comparison, however, is constrained by the fact that the indicators are ordered in First Steps by allocating them to phases. Indicators within a phase are not ordered.[4] Consequently, if a comparison between the ordering of the indicators derived from the teachers' data and a First Steps Continuum is to be made, then the indicators must be treated by grouping them

[4]Some indicators are classified as more important (the 'Key' indicators) but they are not ordered in terms of the sequence of development within the phase.

into phases. This raises a question: If the indicators are to be ordered within phases how should the phases group the indicators along a scale of difficulty?

To answer this question a model is proposed which shows the ideal relationship between groups of indicators within phases, when those phases are ordered to reflect sequential development. Such an ideal model will not be found in reality because of small variations in the way in which, at least some students, develop literacy skills. It will also not be found because of variation in the teachers' perceptions of students' competencies; and it will not be found because of errors made by teachers in their judgements. Some teachers may also use teaching strategies which direct children's development away from normal patterns of development. Nevertheless, such a model provides a standard against which to assess how well the First Steps Reading Development Continuum approaches the ideal.

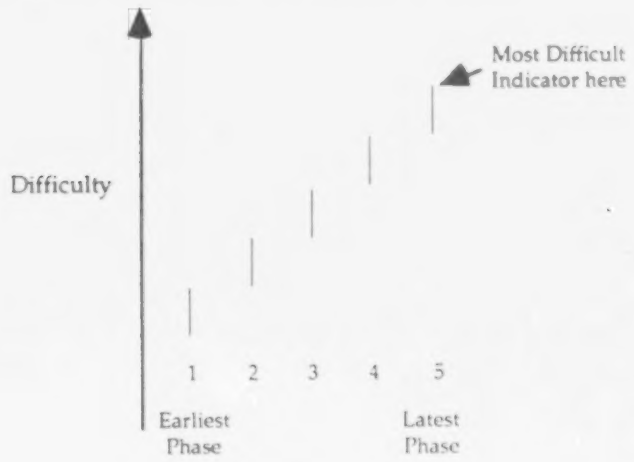
The model proposes, first, that the phase depicting the earliest stages of development should have all of its indicators situated towards the bottom or less difficult end of the scale. Conversely, the phase depicting the most advanced stages of development should have all its indicators situated towards the top or most difficult end of the scale. Other phases should fall between these extremes in the appropriate order. Secondly, each group of indicators within a phase should occupy proportionally the same distance along the scale of difficulty as each of the other groups of indicators. Thus, for example, if there are five phases each should have a range equal to 20% of the total range of difficulty. Thirdly each group of indicators should occupy a unique location on the scale. The location of the phases should not overlap along the difficulty scale. Exhibit 5 shows the proposed ideal distribution of indicators by phase.

The short vertical lines in Exhibit 5 represent the spread of difficulty of the indicators within each phase. The most difficult indicator is situated at the top of the range of indicators in Phase 5. This is marked on the exhibit. Exhibit 5 shows that the spread of estimated difficulty for the indicators within each phase is about the same. There is no overlap between the phases nor is there a gap between them.

The rationale for the characteristics of the ideal model is now given.

Early phases should contain indicators low on the difficulty scale, intermediate phases should contain indicators of intermediate difficulty and later phases should contain indicators of highest difficulty. If the phases are not organised this way, then they are not depicting the sequence of development that children go through. The reason for having the phases is to depict this sequence of development.

Exhibit 5: Depiction of an ideal model showing the distribution of indicators within sequentially ordered phases of development.



There should be a spread of difficulty estimates within a phase because development is seen as occurring along a continuum and not in stages. If it occurred in stages it would be expected that each indicator within a phase would have the same estimated difficulty. However, the spread of indicators within a phase should not be too wide because this will lead to poor discrimination when plotting the development of children. There is little point in allocating a child to a stage if that stage, for example, covers a significant span of their school years. Reasonably fine levels of discrimination are required if development is to be charted and the indicators within a phase are to operate as something more than a checklist of skills. This can be achieved by having the phases ordered along the difficulty scale such that each occupies the same proportion of the total spread of the scale. It should be noted, however, that while 'equal spread' might be thought of as an ideal, it is not necessary to the successful construction and use of a continuum.

The spread of the estimates of difficulty within one phase should not overlap with the spread in any other phase because this can lead to difficulty in establishing the level of development of the child. For example, take the extreme case where the spread of estimated difficulty of indicators within two phases entirely overlap each other on the difficulty scale. When this occurs, allocating a child to one of those phases does not assist in locating that child along the developmental continuum. This suggests that the more overlap there is between phases, the more ambiguity there will be about the level of development of a child.

Ideally, gaps between the spread of estimates of difficulty within one phase and an adjoining phase should also not occur. A gap means that if the child is at a location in their development along the continuum where this gap occurs, then his or her level of development may be under estimated by a teacher using such a continuum. However, as a gap does not lead to a confusion about the sequence of development of the child along a continuum, it is less of a problem than having large overlaps between the phases.

If the ideal model is treated as a valid depiction of how the indicators within phases ought to be ordered along the difficulty scale, then two of the main research questions can be interpreted in terms of this model. The first question - Are the indicators within a phase at about the same level? - requires that the spread along the difficulty scale of the indicators within any one phase is approximately similar to the spread of any other phase. The second question - Do the phases reflect a sequence which implies increasing difficulty? - requires that the location and overlap of the estimated difficulty of the indicators within each phase is compared to the ideal location of phases. This will involve seeing if there is any overlap or gaps between the phases and assessing how consequential these gaps seem to be when compared to the ideal model.

This method of contrasting the observed with an ideal model can also be used to examine the location of the difficulty estimates of the key indicators within phases. This will permit some judgements to be made about their appropriateness as key indicators. The research question about their 'keyedness' is, however, largely dealt with by using another approach.

c. The relationship of the ideal model of a developmental continuum to the validation of the First Steps Reading Development Continuum.

The validation of the Reading Developmental Continuum will involve using the observations, made by teachers about the students' competencies on indicators, to estimate indicator difficulties. These observations can then be compared with the ideal model depicted in Exhibit 5. How well the teachers' observations match the model will shape the conclusions drawn about the validity of the Reading Developmental Continuum.

d. Validation of the Reading Developmental Continuum

The validation begins by displaying the indicators of the Reading Developmental Continuum along the difficulty scale in the most detailed way. As the argument about the validity of the Continuum unfolds these data are displayed with less and less detail. It was decided to begin with the most detailed display because only this display allows individual indicators to be identified. Once the reader is familiar with this display they can refer to it if particular indicators in other displays need to be identified.

Exhibit 6 shows the distribution of 99 indicators in the First Steps Reading Developmental Continuum along a scale of difficulty. The indicators are grouped into one of the five phases of this Continuum used in this validation. The Independent Reading Phase was not used, it will be recalled, because it was judged that no primary school children would be in this phase. Seven of the indicators are excluded from this display because an estimate of difficulty could not be calculated. The Rasch modelling technique requires that those indicators for which either all or none of the students demonstrated the behaviours described are excluded from the analysis.[5] Thus not all indicators are displayed in the body of Exhibit 6. The seven excluded indicators are listed in a box at the bottom of Exhibit 6. These indicators were excluded because all students demonstrated these behaviours.

In this exhibit the indicators are represented by a code number. The code numbers were used to make the graphical display readable. Refer to Appendix A which lists these code numbers and their associated indicators. (The code numbers in Exhibit 6 are the last two digits used in the code numbers listed in Appendix A. They identify the indicator. To use the Appendix, the Phase in which the indicator is located needs to be known.) In Exhibit 6 the key indicators are marked in bold.

[5]Basically, the Rasch modelling technique estimates the difficulty of a literacy behaviour by comparing the number of students who exhibit a literacy behaviour with the number who do not. If all of the students in the sample exhibit a literacy behaviour , then it is impossible to estimate the difficulty of the item except to say that it is less difficult than the easiest estimated literacy behaviour for which there is a measure. It is not possible, however, to establish how much easier it is. Similarly, if none of the children demonstrate a literacy behaviour, then all that can be said is that it is more difficult than the hardest estimated literacy behaviour. Because the difficulty of these behaviours cannot be estimated, they are excluded from the analysis.

Exhibit 6: Estimated difficulty of First Steps indicators from the Reading Developmental Continuum within phases of development.

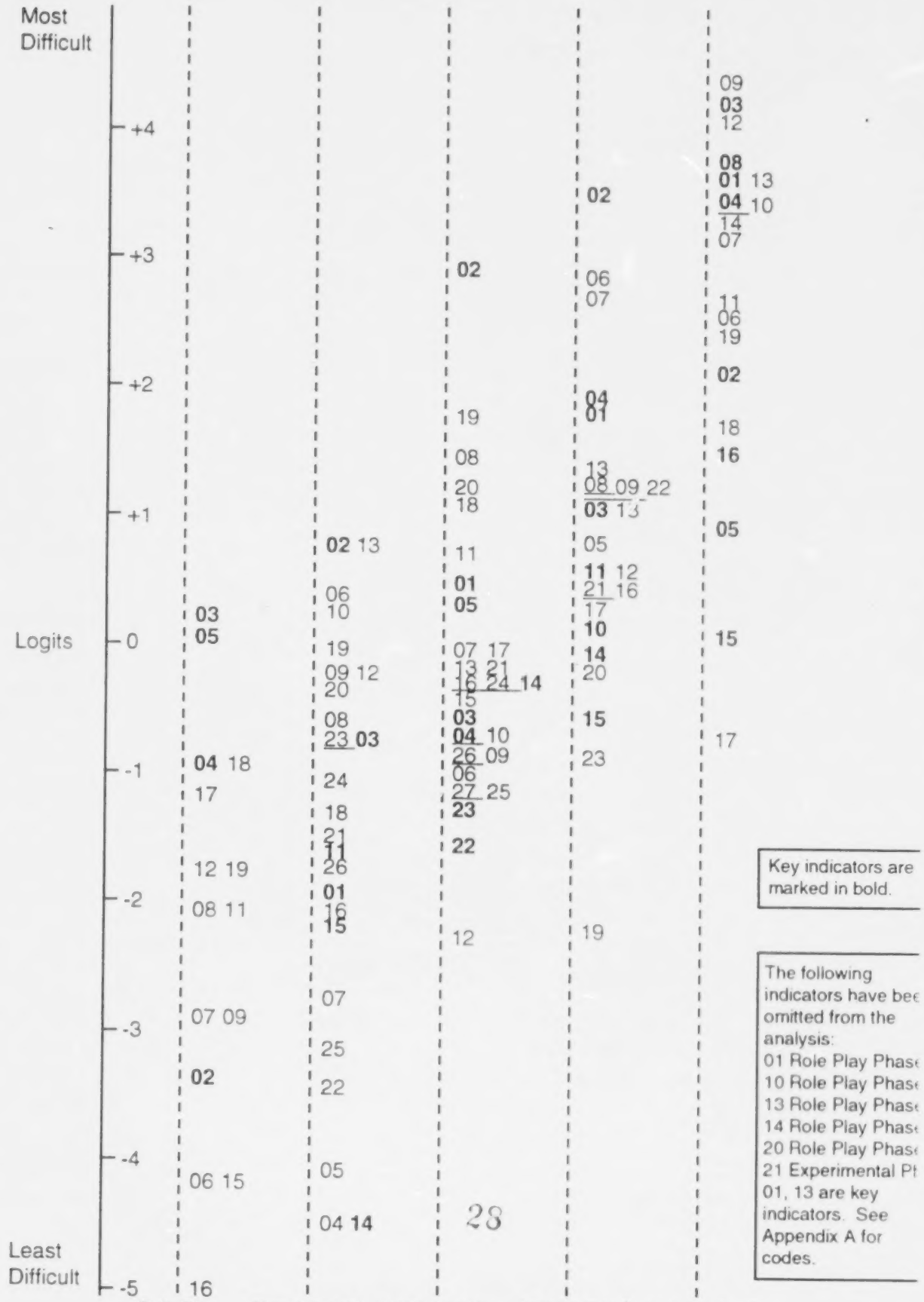


Exhibit 6 is useful for identifying individual indicators or for locating a known indicator. For example, it is clear from Exhibit 6 that indicator 19 in the Transitional Phase requires further investigation as it seems to describe a behaviour that is considerably easier to attain than those behaviours described by the other indicators in this phase. By referring to Appendix A this indicator can be identified. The text of indicator 19 in the Transitional Phase, is 'The child enjoys listening to stories'. This indicator is estimated to be very easy because many children exhibit this behaviour. This may suggest, for example, that this indicator should appear in an earlier phase.

While detailed examination of 'outliers' such as the one discussed above can be useful for modifying the Continuum the present concern is with the general patterns in the data. To do this, less detailed displays (similar to Exhibit 5 which shows a graphical depiction of the ideal model) are required. These simplified versions of the data are now displayed and their contents examined.

Exhibit 7: Difficulty estimates of indicators within phases of the First Steps Reading Developmental Continuum

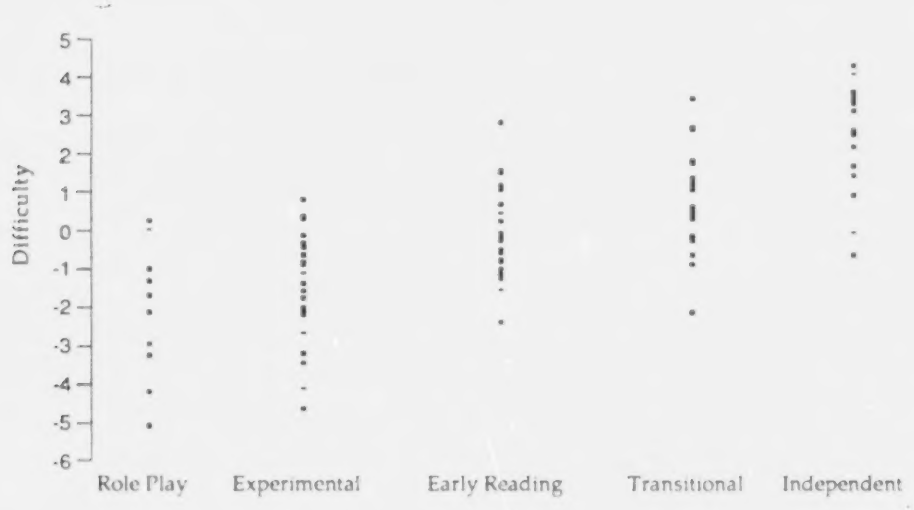


Exhibit 7[6] shows the data as dots. An examination of this dot plot shows that there is a trend in these data. Generally, each successive developmental phase groups indicators into bands along the difficulty scale at locations which reflect increasing difficulty. There does appear, however, to be considerable overlap between the phases. Further exploration of these data is needed to clarify how serious this overlap may be.

[6]The difficulty scale on this and all related plots is measured in logits. A logit is the odds of an outcome transformed to a logarithm with the base *e*.

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Exhibit 7 is unsuitable for making judgements about the spread and so the overlap of the phases. It is unsuitable for two reasons. First, some dots represent more than one indicator (those with the same estimated difficulty) and so not all data are visually represented here. Secondly, a visual examination of a dot plot such as Exhibit 7 only reveals the range of estimates. The range, however, is not the best measure of spread. It is very susceptible to the effect of outliers - points which assume an unexpectedly extreme value when compared with the other values in the group. There is some evidence in Exhibit 7 that some indicators are 'outliers'. For example, there are two indicators with relatively high estimates of difficulty in the Role Play Phase, another one which is possibly too high in the Early Reading Phase and perhaps one indicator with a relatively low estimate in the Transitional phase.

There are other, better measures of the spread than the range. To complement Exhibit 7 then, another display summarising the data in a systematic way, which also reduces the effect of outlying estimates of difficulty, is required. This is done in Exhibit 8. Exhibit 8 shows the data using the median to represent the measure of central tendency and the interquartile range (the central 50% of the data around the median) to represent the spread. These measures are resistant to the effect of outliers.

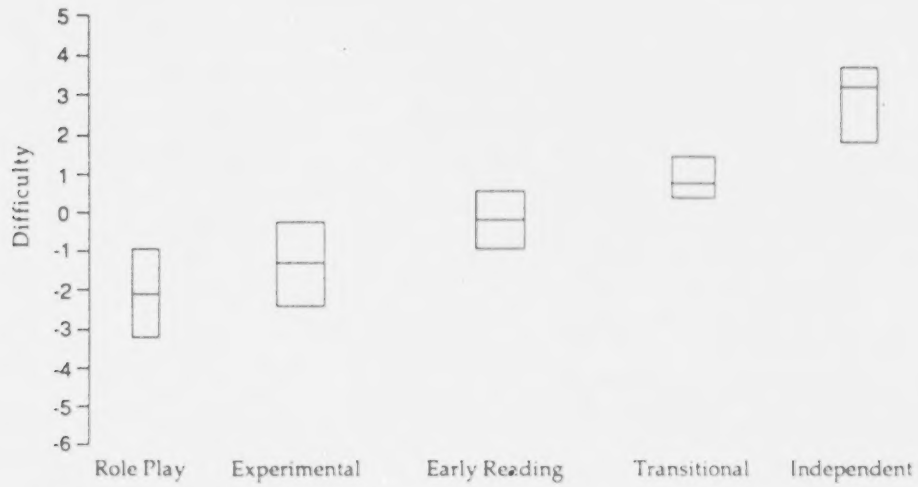
The data in Exhibit 8 are displayed using a type of box plot. The lower boundary of the box identifies the value above which 75% of the estimates fall and the upper boundary of the box identifies the boundary below which 75% of the estimates fall. Thus, 50% of the estimates are located between the top and the bottom of the box. The horizontal line inside the box marks the location of the median. In some boxes the median is not located centrally. In these cases the data are concentrated on the side of the box which is closer to the median. For example, in Exhibit 8, in the Transitional Phase, the indicators are distributed more densely towards the lower end of the box. The (horizontal) width of the boxes is determined by the number of indicators within a phase. The more indicators there are, the wider is the box.

In examining Exhibit 8, it is the location of the median and the length and location of the box plot - the central 50% of the estimates - which is of most importance. It is this box which is taken as giving a fair representation of the spread of the indicators within a phase.

The location of the median for the estimates of difficulty of each phase confirms the conclusion drawn from the examination of the dot plot (Exhibit 7). The median for each phase is located successively higher along the difficulty scale. This is consistent with the claim that, on average, the phases contain indicators which are grouped by

their location along a continuum of development. In other words, on average, phases contain indicators that describe increasing levels of skill or achievement.

Exhibit 8: Box plots of difficulty estimates of indicators within phases of the First Steps Reading Developmental Continuum



The boxes in Exhibit 8 are only about the same length. The Transitional Phase is noticeably shorter than the other phases. However, no one phase has a disproportionately wide spread of estimates. The observed data, in this regard, match the ideal model. This is some evidence in support of the claim that the Reading Developmental Continuum is a valid depiction of the order in which children acquire reading skills.

The extent to which the phases within the Continuum overlap along the difficulty scale is now considered. An overlap between phases is a problem because if it occurs, to any great extent, the phases will not depict development. Its practical effect is to jeopardise the ability of a teacher to use the phases to track the development of a child. In other words, it will not be possible for teachers using the Reading Continuum to make meaningful judgements about the phase or level of a child a child is working at, unless each phase clearly represents different levels of competence.

An examination of Exhibit 8 shows that there is very little overlap between the Early Reading, Transitional and the Independent Phases. There is somewhat more overlap between the Early Reading and the Experimental Phases. There is considerable overlap between the Experimental and the Role Play Phases. This is a concern although it is encouraging to note that the medians for these two phases are ordered

appropriately. On average the Role Play Phase indicators are easier than the Early Reading Phase indicators.

At this point it is important to note that the location of the median and the spread of data within the Role Play phase have been effected by the omission from the analysis of five indicators. These indicators were omitted because every child exhibited evidence of the behaviour that they describe. It is a requirement of the Rasch modelling technique that these observations are removed from the analysis because an accurate estimation of difficulty cannot be calculated. That all children demonstrated the behaviours described by these six omitted indicators means that these indicators are the least difficult to achieve behaviours. If they could be included in the data, their effect would be to lower the location of the interquartile range and probably to lower the median. (With the available data it is not possible to establish how much lower.) Consequently, the median for the Role Play Phase is probably lower than is displayed in Exhibit 8. Similarly, the indicators from this phase are likely to spread further down the scale and so not overlap as much as they do in Exhibit 8. Nevertheless, the overlap is considerable between these two phases.

This finding is contrary to what had been expected. First Steps personnel reported that from their experience with First Steps, teachers find the later phases are harder to discriminate between than the developmentally earlier phases. It is not possible, with the data available to this study, to establish why this result is so at variance with the expected outcome.

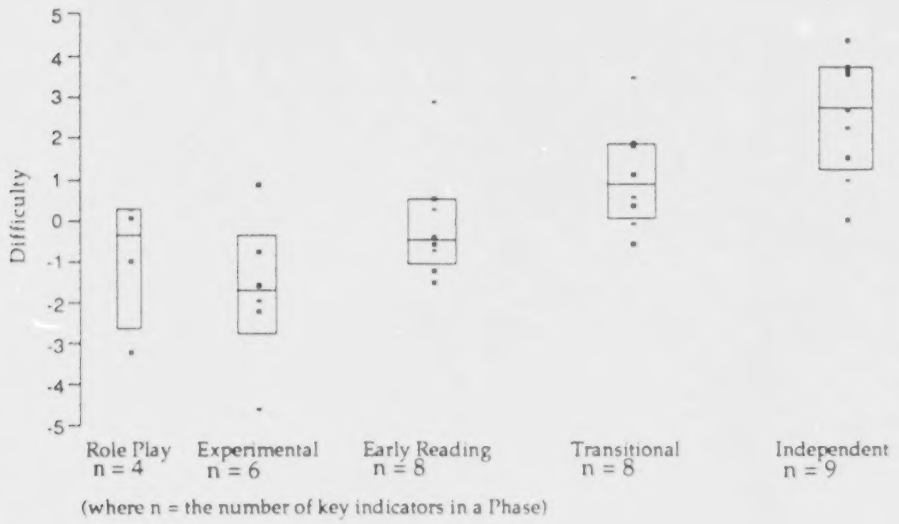
However, in First Steps the location of a child within a phase is not established by the use of all indicators. There are certain indicators which have been defined as 'key' and it is these 'key' indicators which are used to allocate a child to a phase of development. Accordingly, it is how these key indicators are spread within phases and how much overlap there is between phases for these key indicators which is critical for establishing how reliably and how easily teachers can place children into a phase. Exhibit 9 was prepared using the estimates of difficulty for the key indicators only.[7]

Exhibit 9 shows that for the key indicators, there is a small overlap between the Early Reading Phase and the Transitional Phase and there is a small gap between the Transitional and the Independent Phases. There is a larger overlap between the Experimental and the Early Reading Phases. Generally, therefore, these phases are

[7]In Exhibit 9 the data points and the boxes summarising the data are dsiplayed. the boxes are displayed to provide a consistent view of the dta. the dat points are displayed becasue there is so few of them. readers may wish to jhudge how adequately the boxes summarise the data.

roughly similar to the pattern displayed in the ideal model. The key indicators in the Role Play Phase, however, overlap the Experimental Phase and much of the Early Reading Phase. This is a concern. It suggests that the key indicators in the earliest phase are as difficult for children to acquire as in the following two developmental phases. (It should be remembered that two key indicators from the Role Play Phase were eliminated from the analysis because all children exhibited evidence of these behaviours. Had an estimate of the two missing key indicators been included with these data, it is likely that this phase would have less overlap with the other phases.)

Exhibit 9: 'Box plots' with data points overlaid, of the difficulty estimates of key indicators within five phases of the Reading Developmental Continuum.



(where n = the number of key indicators in a Phase)

The three most difficult key indicators in the Role Play Phase, in order of difficulty, are;

- The child focuses on the meaning of a story or informational text. Children's responses reflect understanding of the ideas presented in the text. Story reconstruction is meaningful. (2103)

- The child uses prior knowledge of context and personal experience to make meaning, e.g. "My dog jumps up too.", "That's like my nanna." (2105)

- The child uses pictorial cues e.g. pointing to a picture in The Three Little Pigs', says "The three little pigs left home." (2104)

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As has already been noted, this finding was unexpected. First Steps regards the Role Play indicators as describing very early reading behaviours. In this phase, children focus on the meaning of a story by using pictures or memory. It is only in the Experimental phase where children focus on the print and try to match spoken words with written words. First Steps notes the following of the Role Play Phase;

> "Children in this phase have become aware of books and the joy that reading brings. They have begun to notice print in the environment. They will display reading-like behaviours, holding the book the right way up and turning pages, however their reading at this stage is purely inventive. Children will sit turning the pages either making up a story from the pictures or telling the story from memory. At this stage of development the child is unable to match written words to spoken words."
> *Language Development: Reading Developmental Continuum*, 1992, p..4

An examination of the wording of the two most difficult key indicators shows that this focus on pictures and the use of memory may not be obvious from the wording used in these indicators. In 2103, with the repeated emphasis on 'text' and the extraction of meaning from the 'text', the notion that the child is relying on pictures and memory is not at all clear. Similarly, 2105 does not seem to be describing an easy to acquire behaviour. This suggests that the wording of the indicators may require revision. In this context, it is interesting that the indicator which emphasises the use of pictures is considerably easier than the other two indicators.

However, because this finding was so at variance with the experiences of the First Steps personnel, it was decided to further investigate the problem. There were four kindergarten teachers who supplied the data for the validation of the Reading Developmental Continuum. Only Kindergarten teachers provided data for the Role Play Phase. It was decided to further investigate these teachers' understanding of First Steps by examining the questionnaires which they also completed as part of the evaluation.

The four teachers came from three different schools. Of the four teachers, two returned questionnaires. An examination of these questionnaires showed that these two teachers were skilled and deliberative users of First Steps with a good grasp of the ideas and practices engendered by the Project. For example, one teacher wrote;

> "I found the Continua a very accurate and useful tool in helping me to identify where my students are 'at'. ... The information I record on the Developmental Continua allows me to then plan a program to advance the children to the next stage/phase."

This is a teacher who uses and understands the appropriate use of First Steps materials. This teacher also stresses the importance of inservicing for the proper use of First Steps. He or she writes;

> "It is extremely important that teachers are adequately inserviced and not just use some of the materials in an ad hoc fashion."

The other Kindergarten teacher wrote that;

> "The continua provide an excellent guide on each child's development because each child develops at different rates and times. By using the continua, I have a detailed report on the level of each child at any given time."

Again this suggests that this teacher is an experienced and competent user of First Steps materials and ideas.

Both of these teachers used four developmental continua with their class. It seems unlikely that these data were provided by teachers who were unfamiliar with First Steps ideas or practices. It is therefore seems reasonable to have confidence in their judgements. This suggests that the problems with the key indicators may be with their wording.

There are other features of Exhibit 9 which are also of concern.

The experimental phase has two indicators which seem extreme. The first indicator is, 'The child is focussed on expressing the meaning of a story rather than on reading words accurately.' (2202) This indicator seems, on the evidence here, to be overly difficult for this phase when compared with the other indicators in it. The second

indicator is 'The child recognises some words and letters in context, especially letters from own name and other significant personal and environmental words, e.g. Stop'. (2214) This indicator seems to be much easier than the other key indicators in the Experimental Phase.

The Early Reading Phase has one key indicator which seems to be too difficult. This is the indicator 'The child talks about ways in which people communicate ideas through texts such as books and advertisements for a range of purposes e.g. to entertain, to inform, to persuade' (2302). The Transitional Phase also has one key indicator which seems to be too difficult. This is the indicator 'The child discusses and compares own interpretation of texts with that of others, providing evidence relating to plot and characterisation in narrative or to main idea and supporting detail in informational text'. (2402)

Each of these key indicators may need to be examined with a view to moving them to another phase or rewording them so that their meaning is clearer to teachers.

In summary then, the evidence collected from the teachers about the behaviours exhibited by their students described by the First Steps key indicators suggests that the key indicators are, generally, grouped into the appropriate phases of the First Steps Reading Developmental Continuum. There is a number however, which may require further investigation. The developmentally earliest phase - the Role Play Phase - seems to have key indicators which are very difficult compared with the indicators in the developmentally later Experimental and Early Reading Phases.

Finally, it should be noted that where there are large overlaps between phases or where a developmentally later phase is on average less difficult than an earlier phase there are a number of possible reasons for this occurring. Some of these reasons include:

- *Some indicators have been placed in the wrong phase by First Steps.* By moving the incorrectly located indicators into the correct phase the problems of overlap and of incorrect sequencing of the phases will be remedied.
- *Some indicators are imprecisely worded leading teachers to have differing interpretations of them.* If the wording of these indicators is changed to clarify their meaning then the indicators may be more precisely located.
- *Some examples used to illustrate a behaviour, which form part of the wording of an indicator, may be misleading.* A review of the effect of the examples on the interpretation of the meaning of an indicator could lead to a more precise interpretation of the indicator by teachers.

- *Some phases are intrinsically difficult to discriminate between.* It may be the case that the differences between two phases are both real and consequential but also subtle and difficult to detect. In this case, teachers' interpretations will be inconsistent when attempting to distinguish between phases.
- *Some pedagogical practices may discourage children from following the development depicted in the Continua.*

Each of these factors may alone or in conjunction affect the estimated difficulty of the indicators.

e. How 'key' are the key indicators?

Every phase of a First Steps Continuum has some indicators defined as 'key'. These indicators are used to allocate children to a phase of development. They were defined as 'key' by First Steps using in-house research done by First Steps personnel and advice taken from the users of First Steps.

The aim of this section is to examine how 'key' these 'key indicators' are. First, however, an introduction is given to the method by which the 'keyedness' of the key indicators is estimated.

Earlier, a First Steps Continuum was likened to a path along which indicators are placed to act like milestones or sign posts. These milestones tell the teacher where the child is in their development. So far, the analysis has been concerned with locating where these milestones are along the length of the path. The next task might be likened to establishing how close these milestones are placed to this path. If the milestones are close to the path then their message is clear and unambiguous about a child's location on the path. Such indicators would be good candidates for being defined as key indicators. The further from the path the milestones lie, the more indistinct and ambiguous becomes their message. If they are a long way from the path it may not be clear that they refer to this path at all but to another.

This analogy, using milestones and paths needs to be treated cautiously for, like all analogies, it is limited. A more precise description of the approach used is needed. A First Steps Continuum can be treated as a variable. This variable, when measured can be construed as tapping an underlying 'trait' named, say, 'reading ability' (in the case of the Reading Developmental Continuum). Once conceived this way, the Rasch modelling technique can be used to provide an estimate of the extent to which any one indicator is consistent with this underlying variable. If a 'key indicator' is defined as

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an indicator which is strongly consistent with the underlying variable, then Rasch modelling can be used to estimate how 'key' the key indicators of a First Steps Continuum are. It can also show which of those indicators that are currently not defined as 'key', might be good candidates for being defined as such, if changes are required.

The measure used to estimate the consistency of an indicator with the underlying variable is called the 'Infit Mean Square'. Exhibit 10 shows values of the Infit Mean Square for each of the indicators from the Reading Developmental Continuum. The scale has been divided into three zones. There is a left hand zone, a central zone which has a column of dots marking its boundaries and a right hand zone. Although the locations of these zones are somewhat arbitrary they are based upon practical experience with this technique.[8]

An indicator with a value falling inside the central zone is measuring the underlying variable to a satisfactory extent. In Exhibit 10 an example of one such indicator is the First Steps indicator coded with the number 2112.

An indicator with a value in the right hand zone (that is with an Infit Mean Square value of about 1.4 or more) has a less than ideal correlation with the other indicators developed for this Continuum. (See Indicator 2104, for example, in Exhibit 10.)

Indicators with Infit Mean Square values in the left hand zone of Exhibit 10 are strongly correlated with the dimension being defined by the full set of indicators. These indicators can be regarded as candidates for being defined as 'key indicators'. Indicator 2102 in Exhibit 10 is an example of one such indicator.

In Exhibit 10 the letter 'K' in the body of the table marks the location of the Infit Mean Square for each of the key indicators of the Reading Developmental Continuum. The Infit mean squares of all other indicators are marked using an aster '*'. The first column lists the code number of each of the indicators in the Reading Developmental Continuum that were included in the analysis. Appendix A provides the link between these code numbers and the text of the indicators. (It might be useful, however, to note here that the second digit of the code number identifies the phase of the indicator. Thus the digit '1' in this location means the first or the 'Role Play Phase' and '2' means the 'Experimental Phase' and so on.)

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[8]Given the use of the 'path' as an analogy for a First Steps continuum throughout this report it is probably important to note that the central column in Exhibit 10 ought not to be regarded as representing a path.

Exhibit 10: Item fit of First Steps Reading Developmental Continuum indicators.

Continued next page

Exhibit 20: Item fit of First Steps Reading Developmental Continuum indicators *(Continued)*

An examination of Exhibit 10 shows that most key indicators in the Reading Developmental Continuum fall within the central zone or the left hand zone. These key indicators can thus be considered consistent with the concept that underlies or defines this Continuum, namely 'reading ability'. In the vernacular - these key indicators all 'hang together well'.

There are, however, a number of key indicators which do not seem to be contributing *to the variable underlying the Reading* Development Continuum. There are two key indicators in the Role Play Phase. These are 'The child uses pictorial cues e.g. pointing to a picture in The Three Little Pigs', says "The three little pigs left home." (2104) and 'The child uses prior knowledge of context and personal experience to make meaning, e.g. "My dog jumps up too.", "That's like my nanna." (2105) Of these two, the first - 2104 - is the more disturbing. It has quite an extreme Infit Mean Square value, suggesting that this indicator needs careful consideration.

The other three key indicators which do not seem to be contributing to the underlying variable defining the Continuum are 2304, 2404 and 2515. These are not as extreme as 2104 but should, nevertheless, be closely examined to clarify their meaning, or to remove them from the list of indicators used to describe the Reading Development Continuum.

Those indicators which are currently not defined as key but might be considered as candidates for being defined as key, on the basis of these data, are as follows:

Phase	Indicator code
Role Play	2106, 2107, 2108, 2109,
Experimental	2207, 2208, 2213, 2216, 2218, 2221
Early Reading	2306, 2316, 2317, 2326, 2327
Transitional	nil
Advanced	2506, 2512

The indicators from the Reading Developmental Continuum which are identified as having a relatively low correlation with the majority of the indicators are:

Phase	Indicator code
Role Play	2104 (key), 2105 (key), 2111, 2118, 2119
Experimental	2222, 2223, 2224, 2225
Early Reading	2304 (key), 2311, 2312, 2313, 2321, 2324,
Transitional	2404 (key)
Independent	2513, 2515

There are thus 18 indicators in the Reading Developmental Continuum which could be considered for either revision of their wording or removal from the Continuum because, on the data used here, they are not consistent or strongly consistent with the

Continuum of which they have been defined as part. More positively, about 80% of indicators are either consistent or are strongly consistent with the continuum

There is some evidence in Exhibit 10 that the phases describing behaviours that occur late in children's development are more coherent than the earlier phases. In particular, the Role Play Phase seems to require reworking. This is especially so given that two key indicators from this Phase have a high (therefore, poor) Infit Mean Square.

PART 2: THE RESPONSE OF CLASSROOM TEACHERS TO THE FIRST STEPS CONTINUA

In this section of the report the views held by Kindergarten, Year 1, 3, 5 and 7 classroom teachers about the usefulness and the validity of the First Steps Continua are examined. These views are taken from responses to questionnaires. The questionnaires were sent to selected schools in November 1993. The empirical validation in the first section of this report only examined the Reading Developmental Continuum. In this section, because teachers were asked about the five First Steps Continua, all continua are considered.

There were 157 teachers from 31 schools who agreed to participate in this part of the evaluation.[9] Responses came from 120 classroom teachers in 26 schools. This represents a response rate from teachers of around 75%. Of these 120 teachers, 16 were teaching Kindergarten at the time of the survey, 22 were teaching Year 1, 15 were teaching Year 3, 14 were teaching Year 5, 14 were teaching Year 7, 33 were teaching combined Year level classes and 5 were teaching either Year 2, 4 or 6. It is not clear how the Year 2, 4 or 6 teachers came to answer the survey because these Year level teachers were not asked to participate. Their responses have been included. This is justified on the grounds that, as the sample was not randomly drawn, little was to be lost by including them, and perhaps much was to be gained.

The sample was not randomly drawn and the findings from this part of the evaluation are not generalisable. They can only be used either as pointers to further research, or to gain insights, or to draw on the wealth of experience that teachers have had with First Steps.

Examination of some survey data about the First Steps Continua from classroom teachers.

Teachers were asked to identify the First Steps Continua which they had used in their class in 1993. The most commonly used was the Spelling Developmental Continuum (85% of the teachers), followed closely by the Writing Developmental Continuum (80%). The Writing Learning Continuum, the Reading Developmental Continuum and the Oral Language Developmental Continuum were used by between 35% and 40% of

[9]These were the teachers and schools who supplied data for either the validation of the Reading Developmental Continuum or who provided data for the revalidation of the Spelling Developmental Continuum. Their questionnaire responses are combined in this section of the report. This is why, for example, in Part 1 there are only four Kindergarten teachers who are reported as supplying data whereas i this part of the report there are 16 Kindergarten teachers.

the teachers. As a consequence, most of the general comments they make (that is when they do not refer explicitly to a specific Continuum) probably refer to the Spelling and Writing Developmental Continua.

Only 13 teachers reported using only one Continuum in 1993. Most reported using two Continua. There were 44 (or 37% of teachers) using two Continua. About a quarter of teachers reported using three or four Continua in their class during 1993. A small number, 4, reported using all five Continua. Most teachers replying to the survey, therefore, have had wide experience with First Steps. This makes their comments important.

So, to what extent do teachers in this sample regard the Continua as accurately depicting the development of skills in the students which they teach?

Teachers were asked in the survey to describe how well the Continua which they had used, depicted the development observed in their students. Some teachers commented upon the Continua in general, and others referred to a specific continuum. Their responses were coded into 3 broad categories. Exhibit 10 describes the frequencies in each of these categories.

Exhibit 25: Number and percentage of classroom teachers reporting how well the Continua which they used in 1993, depict the development of their students.

Continua	Very Well	Reasonably Well	Poorly	No Comment or Missing
Writing Development	14	5	0	101
Writing Learning	4	0	0	116
Spelling Development	16	6	1	97
Reading Development	2	1	0	117
Oral Language Development	2	2	0	116
Continuum not identified	65	17	2	36

Note that as there is double counting down the columns, no column totals are provided. All rows total to 120.

These data show that, generally, so far as these classroom teachers are concerned, the Continua accurately depict the development of literacy skills of their students.

Some comments from the teachers will help to give a sense of how they see the Continua as depicting development and the implications this has for their teaching practice.

A number of teachers did not get to specifics, but did comment very positively about the continua. One teacher wrote, for example;

> "The Continua depict the development of the students particularly well. The development/progression of each child can be seen clearly. By using the continua the classroom teacher has a base to work from [using] the clearly set out strategies."

Of those 65 teachers who, without specifying Continua, reported that the Continua depicted the development of children very well, 25 of them referred to the strategies that First Steps provided in conjunction with the Continua. For example, one teacher wrote;

> "Very good! It gives you an accurate picture of where the children are, and from there you've got the appropriate strategies/activities to move them along to the next phase. For example my class fell down on editing or punctuation skills at the beginning, and the Writing Continuum picked this up .."

Other teachers commented positively about how accurate the indicators are. Others referred to how helpful the Continua are for communicating with parents. Others focused upon the effects on the children. One teacher, for example, wrote;

> "The preliminary spelling phase reflects very accurately, the development seen in our Pre-Primary (5 year old) children. I have not gone 'overboard' this year with trying to implement First Steps but by following the 'Major Teaching Emphases' for the Preliminary stage [I feel] that this group of children are more aware of print and the purpose and actual mechanics of writing, than previous groups have been. Even those not yet interested in recording are fully aware of the differences between print and pictures."

Some teachers were less enthusiastic. These were defined as viewing the Continua as

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depicting 'Reasonably Well' the development of the children in their class. A typical example is as follows;

> 'They [the Continua] depict the development of most students quite well - as anticipated by our own observations.'

Others were more specific. About half of the teachers who felt the Continua showed the development of their children only reasonably well referred to ambiguity in the wording of the indicators or to other practical problems. For example, one teacher wrote;

> "Very accurate examples on continua help to establish the phase at which each child is. However, [for] those children who are not yet [at] any phase it is difficult to assess their development until they reach a phase."

Some teachers also complained that the continua were too detailed. Others thought the opposite. One argued;

> "The movement on the continua is far too slow. [N]ot enough progress can be seen. There need to be more indicators to show improvement."

Others were more specific.

> "I feel the students are more willing to have a go, however, I don't think it does anything to remedy the really weak children. With some who have error after error, their spelling journals are filled to the limit with no real sense of achievement at the end."

The teachers were asked to comment upon how the Continua could be further improved and developed. Their responses are summarised in Exhibit 11. This shows that the most commonly reported problem with the continua is ambiguity in the wording of the indicators. A typical example of such a concern comes from a teacher who wrote that;

> "Some comments are a trifle hard to interpret. e.g. 'Willing to have a go at representing speech in print.' Needs clarifying - some people argue

that it just means spoken words others thing children need to do actual "[quote marks]"."

Others are less specific. For example,

"Some parts of each continua are open to individual interpretation which may cause difficulties as the continua are passed through the year levels.'

Exhibit 11: Teachers' views of how the First Steps Continua could be improved.

Reason	N.	Percent
No changes needed	13	11
Phases too broad	13	11
Indicators too detailed	13	11
Simplify terminology	4	3
Ambiguity of wording	37	31
No negative indicators	5	4
More materials needed	11	9
Other	9	8
Missing	13	11
Total	120	100

Note that only the most important reason from each response by a teacher was coded. There is no double counting in Exhibit 11. The most important reason was the one identified as such by the respondent or which had the most words given up to it by the respondent or, where neither of these applied, was the first reason given.

Finally, teachers were asked to make a general assessment of how helpful each of the First Steps Continua had been to them through out 1993. Exhibit 12 shows that for most teachers responding to this item, the Continua were either 'Very Helpful' or 'Helpful'. A small number reported that the continua were neither helpful nor unhelpful. Even fewer reported that the Continua were unhelpful.

Despite the reservations that teachers express about some aspects of the First Steps Continua, then, the group in the sample used here, are overwhelmingly of the view that the Continua are helpful to them. This can be seen most clearly with the Spelling Developmental Continuum where 88% of teachers in this sample reported the Continuum as either helpful or very helpful. It needs to be noted at this point that

because of the sampling method used to select teachers, these findings, are not generalisable. They do, however, co-incide with, generalisable findings from the earlier ACER studies of First Steps.

Exhibit 12: Number of teachers reporting how helpful the First Steps Continua had been to them in teaching their class in 1993.

Continua	Very Helpful	Helpful	Neither	Unhelpful	Very Unhelpful	Total response
Writing Development	46 (47%)	44 (45%)	7 (7%)	0	0	97 (100%)
Writing Learning	23 (55%)	18 (43%)	1 (2%)	0	0	42 (100%
Spelling	49 (48%)	48 (47%)	4 (4%)	1 (1%)	0	102 (100%
Reading	22 (43%)	24 (47%)	4 (8%)	1 (2%)	0	51 (100%
Oral Language	9 (27%)	19 (58%)	4 (12%)	1 (3%)	0	33 (100%

In summary then, teachers in the sample used here, find the First Steps Continua to be helpful, to depict the development of the children in their class with accuracy and they claim this despite some concerns with the wording of some of the indicators in the various Continua.

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APPENDIX A:

Code numbers for the First Steps Reading Developmental Continua indicators

For ease of use and to avoid cluttered graphical displays, indicators were allocated codes. The codes and the indicators are listed below.

The first digit identifies the Continuum from which the indicator comes. (This is consistent with the numbering of codes used in other publication associated with the ACER evaluation of First Steps. Strictly, this code number is unnecessary in this report.) The second digit identifies the phase in which the indicator is located. For this second digit the code 1 = the Role Play Phase, 2 = the Experimental Phase, 3 = Early Reading Phase, 4 = Transitional Phase, 5 = Independent Phase and 6 = Advanced Phase. (The Advanced Phase is not used in the validation. The Advanced Phase indicators are included here for completeness.) The third and fourth digits identify the indicators. The fifth character of the code indicates the response set available to teachers when they were entering the data. For those indicators with the code 'B' the teachers had the 'Yes' / 'No' / 'Beyond' response categories and for the code 'Y' they had the 'Yes' / 'No' response categories.

1. Role Play Phase, Reading Continuum

2101 Y
displays reading-like behaviour
- holding book the right way up
- turning the pages appropriately
- looking at words and pictures
- using pictures to construct ideas

2102 B
realises that print carries a message but may read the writing differently each time e.g. when reading scribble to parents

2103 Y
focuses on the meaning of a story or informational text. Children's responses reflect understanding of the ideas presented in the text. Story reconstruction is meaningful.

2104 Y
uses pictorial cues e.g. pointing to a picture in The Three Little Pigs', says "The three little pigs left home."

2105 Y
uses prior knowledge of context and personal experience to make meaning, e.g. "My dog jumps up too.", "That's like my nanna."

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Role Play Phase, Reading Continuum (Cont.)

2106 B
uses pictorial cues to help reconstruct the story

2107 B
turns the pages of the book, telling the story from memory

2108 Y
knows that writing and drawing are different e.g. "Mummy reads the black bits."

2109 Y
reacts to environmental print e.g. noticing a fast food sign the child says, "I want a hamburger."

2110 Y
selects favourite books from a range e.g. selects a book saying, "I want The Three Little Pigs."

2111 Y
is familiar with and talks about stories

2112 B
is beginning to use some book language appropriately, e.g. 'Once upon a time ...'. The child may use a 'reading voice'.

2113 Y
recognises own name or part of it in print

2114 B
is beginning to recognise some letters e.g. Sam says "That's my name", pointing to Stop sign.

2115 B
displays curiosity about print by experimenting with 'writing' and drawing and asking, "What does that say?"

2116 Y
wants to look at books

2117 B
offers to 'read' writing and points to text while 'reading', indicating the beginning of 'having-a-go'

2118 Y
enjoys stories and asks for them to be read and re-read

2119 Y
spontaneously talks about favourite part of stories

Role Play Phase, Reading Continuum (Cont.)

2120 B
expresses enjoyment by clapping, joining in orally and responding emotively when listening to familiar stories.

2121 Y
eagerly anticipates book-reading events that are part of daily routine

2. Experimental Phase, Reading Continuum

2201
realises that print contains a constant message, e.g. that the words of a written story remain the same, but the words of an oral story may change

2202 Y
is focussed on expressing the meaning of a story rather than on reading words accurately.

2203 Y
uses prior knowledge of context and personal experience to make meaning. e.g. uses memory of a text to match spoken with written words

2204 Y
knows that print goes from left to right and from top to bottom of a page

2205 B
responds to and uses simple terminology such as book, right way up, front, back, upside down, letter, word, sentence.

2206 B
is beginning to demonstrate awareness of literary language, e.g. 'a long, long time ago ...' 'by the fire sat the cat', '"No, no, no"; said the ...'.

2207 Y
can tell what a story is about from the title and illustrations, e.g. "I want the story about the big black cat"

2208 B
shows an ability to connect ideas and events from stories by retelling events in a story in sequence using pictures, memory of the story and knowledge of story structure.

2209 Y
expresses personal views about the actions of a character and speculates on own behaviour in a similar situation, e.g. "If I had been ... I would have ..."

2210 B
sub vocalises or whispers when reading silently

Experimental Phase, Reading Continuum (Cont.)

2211 B
is beginning to demonstrate understanding of one-to-one correspondence between spoken and written words, for instance the child slows down when dictating to an adult

2212 Y
asks for assistance with some words. May be aware that own reading is not accurate and may seek help, re-read or stop reading

2213 Y
uses patterns of language to predict words or phrases

2214 B
recognises some words and letters in context, especially letters from own name and other significant personal and environmental words, e.g. Stop

2215 B
is beginning to match some spoken words with written words when reading a book or environmental print

2216 B
is developing the ability to separate a word from the object it represents. For instance the child realises that 'Dad' is a little word not that, 'Dad' is a big word because Dad is big.

2217 B
recognises some letters of the alphabet and is able to name them

2218 B
demonstrates some knowledge of letter-sound relationships, for instance, the sound represented by the initial and most salient letters in words.

2219 B
points to specific known words as they are read

2220 Y
uses initial letter sounds to predict words in text

2221 B
is beginning to see self as a reader and talks about own reading

2222 B
enjoys stories and asks for them to be read and re read

2223 Y
takes risks by guessing and inventing meanings

2224 B
joins in and acts out familiar stories

2225 Y
eagerly selects books to read for pleasure

2226 Y
self-selects texts on the basis of interest or familiarity

3. Early Reading Phase

2301 Y
carefully reads text, demonstrating the understanding that meaning is vested in the words

2302 Y
talks about ways in which people communicate ideas through texts such as books and advertisements for a range of purposes e.g. to entertain, to inform, to persuade

2303 Y
can identify and talk about a range of different text forms, such as letters, lists, recipes, stories, informational texts

2304 Y
retells the main content of a story or informational text and supplies some supporting information

2305 Y
looks for and talks about ideas and information from informational texts, making links to own knowledge

2306 B
is beginning to read familiar texts confidently, e.g. language experience recounts, shared books

2307 Y
elaborates answers to questions, e.g. 'It is a scary story because it's about a mean old witch who eats people.'

2308 Y
makes comparisons with other texts read. The child's comments could relate to theme, character, plot, information

2309 Y
talks about characters in books using picture clues, personal experience and knowledge of the text to make inferences

2310 Y
provides detail about characters, setting and events when retelling a story

Early Reading Phase, (Cont.)

2311 Y
interprets advertisements and ideas and information from texts from personal viewpoint

2312 Y
when questioned can reflect on own strategies at the level of the whole text, e.g. "I knew it was going to be about a baby dinosaur 'cos I looked at all the pictures first."

2313 Y
reads silently, but may sometimes sub vocalise

2314 B
may read word-by-word or line-by-line when reading an unfamiliar text, i.e. reading performance may be word centred. Fluency and expression may become stilted as the child focuses on decoding.

2315 B
generally makes meaningful substitutions, however over reliance on grapho-phonics may cause some meaning to be lost

2316 Y
uses picture cues, knowledge of language patterns and context to work out the meaning of unknown words

2317 B
is beginning to use self-correction as a strategy

2318 Y
uses knowledge of sentence structure and punctuation to help make meaning (syntactic strategies)

2319 B
sometimes reads-on to confirm meaning, however some children may read on regardless

2320 Y
re-reads passage in order to clarify meaning that may have been lost due to word-by-word reading. May re-read a phrase, a sentence or a paragraph

2321 Y
when questioned can reflect on own strategies at the sentence level e.g. 'I knew he was going to say that, 'cos he said it two times already.'

2322 Y
has a bank of words which are recognised when encountered in different contexts, e.g. in a book, on the blackboard or on a chart

2323 B
relies heavily on beginning letters and sounding out for word identification (graphophonic) strategies

Early Reading Phase, (Cont.)

2324 B
points as an aid to reading, using finger, eyes or voice

2325 B
locates words from sources such as word banks and environmental print

2326 Y
when questioned can reflect on own word identification strategies, e.g. "I sounded it out."

2327 Y
is willing to 'have-a-go' at reading unknown words

4. Transitional Phase, Reading Continuum

2401 Y
shows an ability to construct meaning by integrating knowledge of:
- personal experiences
- text structure, e.g. a letter, a recount, a report, a narrative
- text organisation, e.g. introduction, conclusion, paragraphs, chapters
- language features, e.g. narrative - descriptive language, reports - subject specific vocabulary, explanation - cause/effect relationships
- context and content

2402 Y
discusses and compares own interpretation of texts with that of others, providing evidence relating to plot and characterisation in narrative or to main idea and supporting detail in informational text

2403 Y
uses a range of strategies effectively to find relevant information in texts, e.g. makes use of table of contents and index

2404 Y
recognises that characters can be stereotypes in a text, e.g. a mother looking after children at home while the father goes to work, a prince rescuing a maiden from a wicked stepmother and suggests how this could be changed.

2405 Y
makes inferences and predictions based on information which is explicitly stated in a text

2406 Y
makes generalisations based on interpretation of texts viewed or read, e.g. confirms, extends, or amends own prior knowledge through reading or viewing

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2407 Y
adjusts reading strategies for different texts and different purposes, e.g. searching for a specific fact in an informational text

Transitional Phase, Reading Continuum (Cont.)

2408 B
reads orally with increasing fluency and expression. Oral reading reflects personal interpretation

2409 Y
makes comparisons with other texts read

2410 B
is becoming efficient in using most of the following strategies for constructing meaning:
- makes predictions and is able to substantiate them
- self-corrects when reading
- re-reads to clarify meaning
- reads on when encountering a difficult text
- slows down when reading difficult texts
- substitutes familiar words
- uses knowledge of print conventions

2411 B
makes meaningful substitutions, i.e. replacement miscues are meaningful, e.g. 'cool' drink for 'cold' drink. The integration of all three cueing systems (semantic, syntactic and grapho-phonic) are developing

2412 Y
uses more print conventions as an aid to understanding, e.g. capitalisation, full stops, commas, exclamation marks, speech marks

2413 Y
is able to reflect on and describe some of the strategies for making meaning

2414 Y
has an increasing bank of sight words, including some difficult and subject-specific words, e.g. science, experiment, February, Christmas

2415 B
is becoming efficient in the use of the following word identification strategies when appropriate:
- sounds out to decode words
- uses initial letters as a cue to decoding
- uses knowledge of common letter patterns to decode words, e.g. th, tion, ough
- uses known parts of words to make sense of the whole word
- uses blending to decode words, e.g. str-ing
- uses word segmentation to make sense of the whole word

2416 Y
is self-motivated to read for pleasure

2417 Y
reads for a range of purposes

Transitional Phase, Reading Continuum (Cont.)

2418 Y
selects texts effectively, integrating reading purpose and level of difficulty

2419 Y
enjoys listening to stories

2420 Y
reads for a range of purposes, e.g. for pleasure or information

2421 Y
responds sensitively to stories read

2422 Y
discusses favourite books and talks about favourite author

2423 Y
selects own reading material according to interest, perceived purpose and level of difficulty

5. Independent Phase, Reading Continuum

2501 Y
reads and comprehends text that is abstract and removed from personal experience and can justify own interpretation of the text

2502 Y
makes inferences based on information implicit in a text and can provide supporting evidence, e.g. having read material on diet and beauty infers that being slim is valued by society and that this is evidenced by the huge sales of alternative fad diets

2503 Y
returns purposefully to make connections between widely separated sections of a text

2504 Y
makes critical comparisons between texts

2505 Y
applies basic research skills effectively such as identifying informational needs, e.g. knowledge of library organisation, knowledge of text organisation, and extracting relevant information

2506 Y
talks with others about interesting or difficult content

2507 Y
can discuss an alternative reading of a text

Independent Phase, Reading Continuum (Cont.)

2508 Y
can justify own interpretation of a text and offer possible reasons why a text may interpreted differently by different people

2509 Y
comments and makes judgements on the ways authors represent people from different cultural and socio-economic groups

2510 B
is beginning to recognise and appreciate that authors manipulate language in a variety of ways to clarify and enhance meaning

2511 Y
can recognise and discuss the elements and purpose of different text structures, e.g. biography, mystery in fiction; exposition, procedure

2512 Y
reflects on and discusses issues and topics that have emerged when reading :
- challenges and criticises text, offering supportive evidence
- organises logical responses to a text
- selects relevant information for own purpose
- identifies and synthesises points of view
- draws conclusions from texts and generalises information extracted from them
- generates expectations about plot and character development

2513 Y
may draw analogies from fiction to gain heightened awareness of self

2514 Y
reads and comments critically on news items, magazine articles, advertisements and letters in the press

2515 Y
uses a range of strategies automatically when constructing meaning from text:
- self corrects
- rereads
- reads on
- slows down
- sub vocalises

2516 Y
uses word identification strategies appropriately and automatically when encountering an unknown word
- knowledge of grapho-phonics
- knowledge of word patterns
- knowledge of word derivations and root words
- syllabification

Independent Phase, Reading Continuum (Cont.)

2517 Y
may discover a particular genre, e.g. horse books or adventure stories and seek out other texts of this type

2518 Y
makes comparisons between texts

2519 Y
demonstrates confidence when reading

6. Advanced Phase, Reading Continuum

2601 Y
can critically reflect on and respond to text providing different levels of interpretation and adopting alternative view points

2602 Y
can stand back and reflect on own reactions to author's perceived ideologies and positions

2603 Y
can recognise specific language forms such as figurative language, jargon and technical language

2604 Y
can recognise and describe the purpose and structure of different genres

2605 Y
reflects personal interpretation of the text through oral reading

2606 Y
can recognise and respond to text complexity, e.g. ambiguity and conflicting messages in text

2607 Y
can compare and contrast different points of view

2608 Y
can identify and integrate layers of facts and concepts within a text

2609 Y
can identify and discuss different authors' styles

2610 Y
can recognise texts as 'cultural constructs ' and can analyse the cultural beliefs underpinning texts

2611 Y
can synthesise information within and across texts

Advanced Phase, Reading Continuum (Cont.)

2612 Y
is able to select, use, monitor and reflect on appropriate strategies for different reading purposes,

2613 Y
is able to interrogate text, articulating problems and formulating relevant questions

2614 Y
can select key information and ignore irrelevant material

2615 Y
can apply understanding of text structure to the acquisition, organisation and application of information

2616 Y
can formulate and apply research strategies

2617 Y
can recognise and analyse bias, propaganda and stereotyping in texts

2618 Y
can draw on literary and cultural repertoires to construct meanings in order to compare the perceived world view of an author with their own

2619 Y
uses reading to enter worlds beyond personal experience

2620 Y
confidently handles new text

2621 Y
responds sensitively and perceptively to literature

2622 Y
reads literature with emotional involvement and reflective detachment

APPENDIX B:

Estimates of the difficulty of the indicators from the First Steps Reading Developmental Continuum

The measure of difficulty of an indicator was estimated using Item Response Theory. This technique requires that those indicators for which either all or none of the students demonstrated a behaviour are removed from the analysis. Consequently, not all indicators appear in the lists below. The estimate of difficulty of the indicators is measured by using the natural log odds of the proportion of students who were identified as not having demonstrated those behaviours described by an indicator. In this appendix, the estimates of difficulty are first ordered by the indicator code number and then ordered by the estimated difficulty of the indicator.

A note on the indicator codes:

The indicator codes have four digits. The codes are the same as those used in Appendix A. The response set codes 'B' and 'Y', used in Appendix A, are not used here. Appendix A will need to be used to link the estimates shown here (Appendix B) back to the wording of the indicators.

The code numbers are ordered so that the first digit identifies the Reading Developmental Continuum, the second digit identifies the phase and the third and fourth digits identify the indicator. The phase code numbers are in the order used by First Steps and so reflect the sequence that they have in the continuum. So, for the Reading Development Continuum, the second digit of the code number means the following:

1 = Role Play Phase
2 = Experimental Phase
3 = Early Reading Phase
4 = Transitional Phase
5 = Independent Phase

Note that no data were collected for the Advanced Phase indicators because it was judged that no primary school child would exhibit the behaviours described by the indicators in this phase.

An example to help use the code numbers. The code number '2102' means 'the Reading Development Continuum', 'Role Play Phase', indicator '02', which is, "The child realises that print carries a message but may read the writing differently each time ..."

1. Indicators ordered by indicator code number.

Reading Indicator Code	Difficulty Estimate
Role Play Reading Phase	
2102	-3.21
2103	0.29
2104	-0.93
2105	0.11
2106	-4.17
2107	-2.87
2108	-2.08
2109	-2.87
2111	-2.08
2112	-1.66
2115	-4.17
2116	-5.00
2117	-1.28
2118	-0.93
2119	-1.66
Experimental Reading Phase	
2201	-1.91
2202	0.87
2203	-0.74
2204	-4.55
2205	-4.07
2206	0.42
2207	-2.60

Experimental Reading Phase (continued)

Reading Indicator Code	Difficulty Estimate
2208	-0.59
2209	-0.25
2210	0.36
2211	-1.52
2212	-0.26
2213	0.87
2214	-4.55
2215	-2.16
2216	-2.04
2218	-1.34
2219	-0.06
2220	-0.38
2221	-1.49
2222	-3.41
2223	-0.78
2224	-1.05
2225	-3.18
2226	-1.69

Early Reading Phase

2301	0.53
2302	2.91
2303	-0.55
2304	-0.70
2305	0.32
2306	-0.99
2307	0.00
2308	1.53
2309	-0.94
2310	-0.77
2311	0.76
2312	-2.35

Early Reading Phase (continued)

Reading Indicator Code	Difficulty Estimate
2313	-0.08
2314	-0.39
2315	-0.42
2316	-0.21
2317	0.00
2318	1.18
2319	1.65
2320	1.27
2321	-0.09
2322	-1.46
2323	-1.20
2324	-0.21
2325	-1.13
2326	-0.93
2327	-1.07

Transitional Reading Phase

2401	1.83
2402	3.52
2403	1.11
2404	1.91
2405	0.72
2406	2.81
2407	2.66
2408	1.34
2409	1.27
2410	0.38
2411	0.60
2412	0.59
2413	1.45
2414	-0.06
2415	-0.56

Transitional Reading Phase (continued)

Reading Indicator Code	Difficulty Estimate
2416	0.50
2417	0.41
2418	1.10
2419	-2.10
2420	-0.19
2421	0.54
2422	1.21
2423	-0.82

Independent Reading Phase

2501	3.69
2502	2.29
2503	4.39
2504	3.58
2505	0.99
2506	2.63
2507	3.25
2508	3.75
2509	4.40
2510	3.53
2511	2.71
2512	4.19
2513	3.69
2514	3.38
2515	0.04
2516	1.52
2517	-0.61
2518	1.77
2519	2.54

2. Indicators ordered by estimate of difficulty

Reading Indicator Code	Difficulty Estimate
2116	-5.00
2204	-4.55
2214	-4.55
2106	-4.17
2115	-4.17
2205	-4.07
2222	-3.41
2102	-3.21
2225	-3.18
2107	-2.87
2109	-2.87
2207	-2.60
2312	-2.35
2215	-2.16
2419	-2.10
2108	-2.08
2111	-2.08
2216	-2.04
2201	-1.91
2226	-1.69
2112	-1.66
2119	-1.66
2211	-1.52
2221	-1.49
2322	-1.46
2218	-1.34
2117	-1.28
2323	-1.20
2325	-1.13
2327	-1.07
2224	-1.05
2306	-0.99
2309	-0.94

Reading Development Continuum Indicators ordered by estimate of difficulty (continued).

Reading Indicator Code	Difficulty Estimate
2104	-0.93
2118	-0.93
2326	-0.93
2423	-0.82
2223	-0.78
2310	-0.77
2203	-0.74
2304	-0.70
2517	-0.61
2208	-0.59
2415	-0.56
2303	-0.55
2315	-0.42
2314	-0.39
2220	-0.38
2212	-0.26
2209	-0.25
2316	-0.21
2324	-0.21
2420	-0.19
2321	-0.09
2313	-0.08
2219	-0.06
2414	-0.06
2307	0
2317	0
2515	0.04
2105	0.11
2103	0.29
2305	0.32
2210	0.36
2410	0.38

Reading Development Continuum Indicators ordered by estimate of difficulty (continued).

Reading Indicator Code	Difficulty Estimate
2417	0.41
2206	0.42
2416	0.50
2301	0.53
2421	0.54
2412	0.59
2411	0.60
2405	0.72
2311	0.76
2202	0.87
2213	0.87
2505	0.99
2418	1.10
2403	1.11
2318	1.18
2422	1.21
2320	1.27
2409	1.27
2408	1.34
2413	1.45
2516	1.52
2308	1.53
2319	1.65
2518	1.77
2401	1.83
2404	1.91
2502	2.29
2519	2.54
2506	2.63
2407	2.66
2511	2.71
2406	2.81

Reading Development Continuum Indicators ordered by estimate of difficulty (continued).

Reading Indicator Code	Difficulty Estimate
2302	2.91
2507	3.25
2514	3.38
2402	3.52
2510	3.53
2504	3.58
2501	3.69
2513	3.69
2508	3.75
2512	4.19
2503	4.39
2509	4.40

APPENDIX C:

List of indicators form the Reading Development Continuum not understood by some Kindergarten, Year, 1, 3, 5 or 7 classroom teachers.

This appendix lists the indicators which were not understood by one or more teachers. The indicators are identified by code numbers. See Appendix A to link the code numbers to the indicators.

Indicator Code	Number of Teachers not Understanding
2218	1
2301	1
2302	1
2311	1
2318	1
2401	2
2402	2
2404	1
2406	1
2412	1
2413	1
2414	1
2417	1
2418	2
2420	1
2421	1
2423	1
2502	1
2503	2
2507	3

APPENDIX D:

Classroom teachers' questionnaire about the First Steps continua.

This appendix consists of the questionnaire which was used to ask classroom teachers about the First Steps Developmental Continua.

The teachers could respond with information about any of the First Steps Continua, and not just to the Reading Developmental Continuum.

ACER

Australian Council for Educational Research,

First Steps Evaluation, 1993

Questionnaire for Classroom Teachers using First Steps

The WA Ministry of Education has commissioned the Australian Council for Educational Research to evaluate the First Steps project. This questionnaire forms one part of the evaluation.

You are one of a small number of classroom teachers chosen from all WA government primary and district high schools. Because there are relatively few teachers being sampled, your response to this survey is especially important for understanding how teachers judge the adequacy of the First Steps Continua.

Your participation in this survey is voluntary. You may refuse to answer any or all of the questions contained in this questionnaire. If you choose not to participate could you please contact me at the address below so that I do not send out reminder notices to you.

Your responses to these questions will be treated confidentially and no schools or individual respondents will be identified in any reports produced as part of this evaluation unless permission is given. (For more information see the access conditions to the data which are available from your school principal.)

If you have any questions about this survey or the evaluation feel free to contact me by phone on (03) 819 1400, fax (03) 819 5502 or by mail at the address below.

The questionnaire will take about 30 minutes to complete. Just how long it takes will depend on your involvement with the First Steps Project. When you have completed this questionnaire, please post it using the attached Reply Paid envelope. If you have misplaced the envelope, **send the completed questionnaire to:**

Adrian Harvey-Beavis
First Steps Evaluation
Reply Post 2
Australian Council for Education Research
PO Box 210
Hawthorn
Victoria 3122

(If you use this address you will not need a postage stamp.)

Please post the completed questionnaire before Friday November 12

Complete this survey form by ticking the appropriate box or by writing in the space provided.

1. **What is the name of this school?** .....
(The name of your school is needed so that other information from other sources can be linked to it, for example, whether it is an urban or rural or remote school It is also needed to check off returns so that you are not sent a reminder notice.)

2. **What Year level is the class that you are now teaching?** .....
(If it is a composite class then write in all Year levels eg Years 4/5)

About the First Steps continua

3. **During any time in 1993 have you used, with the students in the class you are currently teaching, any of the following First Steps Continua?**
(Tick as many boxes as apply)

	Yes
Writing Development Continuum	☐
Writing Learning Continuum	☐
Spelling Development Continuum	☐
Reading Development Continuum	☐
Oral Language Development Continuum	☐

If you have not used any First Steps Continua with the class you are currently teaching ,at any time in 1993 ,then stop here. Thank you for your help.

4. **Comment on how well the Continua (which you are using with the class you are now teaching) depict the development that you see in your students?**

5. How might the First Steps Continua which you have used with the students, in the class you are currently teaching, be further improved and developed?

6. Generally, how helpful do you find the First Steps Continua that you have used this year?

Only tick boxes for those continua that you have been using in 1993 with the class that you are currently teaching.

	Very Helpful	Helpful	Neither helpful nor unhelpful	Unhelpful	Very unhelpful
Writing Developmental Continuum	☐	☐	☐	☐	☐
Writing Learning Continuum	☐	☐	☐	☐	☐
Spelling Developmental Continuum	☐	☐	☐	☐	☐
Reading Developmental Continuum	☐	☐	☐	☐	☐
Oral Language Developmental Continuum	☐	☐	☐	☐	☐

There is a blank back page for you to write any further comments you may have about the First Steps Continua.

Thank you for completing this survey.